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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,378	01/10/2002	Frank W. Harris	UA 335	1584
7590	10/19/2004			
Ray L Weber Renner Kenner Greive Bobak Taylor & Weber Fourth Floor First National Tower Akron, OH 44308-1456			EXAMINER BISSETT, MELANIE D	
			ART UNIT 1711	PAPER NUMBER

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/890,378

Applicant(s)

HARRIS ET AL.

Examiner

Melanie D. Bissett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,9-19 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5,9-19,21 and 22 is/are allowed.
- 6) ☒ Claim(s) 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. The request filed on 9/20/04 for Continued Examination under 37 CFR 1.114 based on parent Application No. 09/890,378 is acceptable and an RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hougham et al. in view of Gardner et al.
4. From a prior Office action:

Hougham discloses low dielectric constant polyimides for use on electrical devices such as capacitors, semiconductors, and integrated circuits (abstract; col. 1 lines 26-35). One noted combination of monomers matches the applicant's formulas (I or IV) and III to form a polyimide of 6FDA-PFMB (col. 11 lines 38-58; Table 2). Such a polymer has a dry dielectric constant of 2.71 (Table 3). Because the term *about 2.7* encompasses values slightly over 2.7 and allowing experimental error, it is the examiner's position that the cited dielectric constant meets the applicant's limitation of *less than about 2.7*.

Further, Hougham teaches dissolving polyamic acids in solvents, including DMAc and NMP, casting and drying a film, heating the film to initiate ring closure and formation of the polyimide, redissolving the film, and cycling the process until a desired molecular weight is achieved (Figure 4; col. 4 lines 13-42). Also, the formation of integrated circuits is mentioned. However, the reference does not specifically indicate casting a dissolved polyimide onto a substrate to form an integrated circuit. Gardner teaches methods for forming an integrated circuit, where the low dielectric materials are deposited or spin-coated onto the substrate (col. 5 lines 44-67). Because Hougham already cycles a process of dissolving a polyimide/polyamic acid, casting the solution onto a substrate, and heating the material to increase molecular weight, it is the examiner's position that it would have been *prima facie* obvious to spin-coat the solution directly onto the integrated circuit substrate to adhere the dielectric material to the substrate from a solution state without additional processing steps. Following the casting procedure of Hougham, the final casting onto an integrated circuit would be heated to further increase molecular weight.

Allowable Subject Matter

5. Claims 1-5, 9-19, and 21-22 are allowed.
6. The closest prior art, Hougham et al. (US 5,324,813 A), discloses low dielectric constant polyimides for use on electrical devices such as capacitors, semiconductors, and integrated circuits. The polyimide materials fit the applicant's formulas (I or IV) and III. However, the reference teaches a dielectric constant for this polymer of 2.71. The reference does not teach forming the polymer to have a dielectric constant of less than about 2.5 or teach the applicant's claimed thermal expansion coefficients. It is therefore the examiner's position that the applicant's claimed dielectric constant of less than about 2.5 and the applicant's claimed thermal expansion coefficients provide a novel and unobvious step over the prior art integrated circuits.

Response to Arguments

7. In response to the applicant's arguments that the presently claimed invention does not cure the polyimide but that it would destroy the primary reference to remove the curing step of the invention, it is first noted that the claims do not exclude curing steps and thus encompass methods including a curing step. Secondly, the original claims call for curing the polyimide. This seems contradictory to the applicant's arguments. Thirdly, the curing step of the primary reference serves to increase the molecular weight of the polyimide/polyamic acid coating by imidizing any remaining polyamic acid. As the process is recycled, less and less imidization occurs. As the

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claims stand, it is the examiner's position that the methods of claims 23-25 would be obvious over the cited prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (571) 272-1068. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


MELANIE BISSETT
PATENT EXAMINER

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